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## A Survey of Lung Health and COPD Awareness amongst Participants at a Mobile Spirometry Clinic

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### Abstract

Chronic Obstructive Pulmonary Disease (COPD) is a leading cause of death in Ireland. It affects over 440,000 people (10% of Ireland's population), but awareness of COPD is low. COPD Support Ireland is a national charity established to advocate for and support those with COPD. For World COPD Day 2013, a mobile clinic visited 5 locations to provide information about COPD and free spirometry testing. In this study, we evaluated participants' level of knowledge about COPD and whether this was correlated with a number of variables. Participants completed a questionnaire (352). Questionnaires were analysed to ascertain this self-presenting population's characteristics. Most (247, 70.2%) were smokers/ex-smokers, yet only 168 (47.7%) knew of COPD. Almost 18% (63, 17.9%) required referral to GPs with abnormal spirometry results. Our findings suggest the need for greater COPD education and awareness to increase earlier diagnosis, reduce health care costs and improve quality of life.

### Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a leading cause of morbidity and mortality both in Ireland and internationally<sup>1</sup>. As well as a major source of morbidity and mortality, COPD also places a significant economic burden on healthcare systems<sup>2</sup>. COPD is the most prevalent respiratory disease in adults in Ireland<sup>3,4</sup>. At least 440,000 people in Ireland have COPD, of whom over 180,000 have moderate or severe disease, only half of whom may be diagnosed<sup>1</sup>. Of the 39 countries, which provide data to WHO Europe, the overall age standardised COPD mortality rate is 18/100,000, but Ireland's is 27.87<sup>5</sup>. Of the Western European countries, only Denmark has a higher mortality rate<sup>5</sup>. Awareness of COPD is low<sup>6</sup> and delay in the diagnosis of COPD is well recognised. A recent UK study of over 39,000 COPD patients showed that more than half had symptoms for six to ten years before the diagnosis was made, and 42% had shown clinical signs that may have been related to COPD between eleven and fifteen years prior to finally being diagnosed.<sup>7</sup> Formed in October 2013, COPD Support Ireland is a charity set up to support and advocate for all those living with COPD and is the country's first COPD national support and advocacy body. It is a patient-led organisation, dedicated to raising awareness about COPD, improving early diagnosis and providing information and guidance to patients and carers living with this condition.

In November of 2013, COPD Support Ireland launched a weeklong, nationwide series of free screening events to coincide with World COPD Day. This was supported by the Irish Thoracic Society and Novartis, a Pharmaceutical Company. Interested participants were invited to complete a questionnaire, were provided with free spirometry screening, and were given information on COPD. Those with abnormal spirometry readings, based on the Global Initiative for Chronic Obstructive Lung Disease (GOLD) Spirometry guidelines<sup>8</sup>, were referred to their General Practitioner (GP). The purpose of the weeklong event was to increase awareness of COPD in the general population,

provide information about COPD to those presenting to the clinic, refer participants identified as being at risk of COPD for further investigation and build awareness for COPD Support Ireland. The aim of our study was to determine the level of knowledge of COPD among participants, and to determine the association between knowledge of COPD and participants' characteristics such as age, gender, family history, education level and smoking history as well as assess undiagnosed disease in the participant population.

### Methods

For World COPD Day 2013, a free COPD Mobile spirometry screening clinic travelled to 5 counties in Ireland from the 18th to the 22nd of November, starting with Dublin followed by Sligo, Mayo, Waterford and finally Cork. Mobile clinics were advertised across local press, radio, TV, medical trade journals and online. Participants presenting at the mobile clinic were requested to complete a questionnaire containing demographic information and information on risk factors associated with COPD. Spirometry tests were carried out by a Respiratory Clinical Nurse Specialist (Respiratory CNS), in accordance with ATS/ERS Taskforce guidelines<sup>9</sup>. The Respiratory CNS did not have access to the completed questionnaire prior to spirometry. Participants were referred to see their General Practitioner if their FEV1/FVC score was outside the GOLD standard. Formal ethics approval was not required. The questionnaire was based on a previous questionnaire used for World Spirometry Day 2012, with additional COPD questions based on feedback of that questionnaire. Anonymous data points were collected on the following: location of clinic, age, gender, education level, smoking history, passive smoke exposure, family history of lung disease, symptoms of lung disease (cough, mucus production, shortness of breath, wheeze), time of day for the worst symptoms, GP visits and knowledge of COPD prior to this event. Data was then compiled in a database and was analysed using IBM SPSS Version 22. Descriptive analysis was carried out to describe the distribution of variables

among participants, summarizing the data using frequencies. We wanted to explore whether knowledge of COPD was correlated with variables such as smoking history, family history, education level, gender and age. Associations between variables were explored using the chi-square test for categorical variables (statistical significance set at  $p < 0.05$ ).

## Results

A total of 352 participants completed the questionnaire. Not all questions were answered by each participant. Missing data is included only in descriptive data, but not in exploring association between variables. Demographic details and factors associated with COPD are listed in (Table 1). A slight majority (52.8%) were male. 63.7% were aged 55 or over. Two thirds had completed secondary school education. Over two thirds of participants had a history of smoking. The majority of participants were current or ex-smokers (247, 70.2%). Of these, 43% had symptoms of lung disease ( $n=105$ ) and 22% had abnormal spirometry and were referred ( $n=54$ ). However, of those who had never smoked ( $n=105$ ), 46% also had symptoms of lung disease ( $n=48$ ), but only 9% had abnormal spirometry and were referred ( $n=9$ ). There was no difference in the previous knowledge of COPD between smokers and non-smokers. Of those who had prior knowledge of COPD, 69% were smokers and 31% were non-smokers and of those who did not have prior knowledge of COPD, 70% were smokers and 30% were non-smokers ( $p = 0.705$ ). Smokers are those who currently smoke or who are ex-smokers whereas non-smokers are only those who have never smoked.

**Table 1: Demographics of participant population**

	N	%
<b>Gender</b>	352	100
Male	186	52.8
Female	166	47.2
<b>Age in years</b>		
Mean	55-64 years of age	
21-34	21	6.0
35-44	36	10.2
45-54	72	20.4
55-64	108	30.7
65-74	95	27.0
>75	20	5.7
<b>Education Level</b>		
Primary	45	12.8
Junior Cert	71	20.2
Leaving Cert	123	34.9
College Degree	60	17.1
Postgrad Degree	23	6.5
Missing	30	8.5
<b>Smoking Habits</b>		
Ex-smoker	156	44.3
Current smoker	91	25.9
Never smoked	105	29.8
<b>Passive Smoke Exposure</b>		
Yes	56	15.9
No	256	72.7
Missing	40	11.4
<b>Family History of Lung Disease</b>		
Yes	72	20.5
No	280	79.5
<b>Symptoms of Lung Disease</b>		
Yes	153	43.5
No	199	56.5
<b>Attending GP for respiratory symptoms</b>		
Yes	83	23.6
No	239	67.9
Missing	30	8.5
<b>COPD Awareness prior to event</b>		
Aware of COPD	168	47.7
Not aware of COPD	162	46.0
Missing	22	6.3
<b>Referral due to abnormal spirometry</b>		
Referred (abnormal spirometry)	63	17.9
Not referred (normal spirometry)	289	82.1

In total, 46% of participants had no previous knowledge of COPD ( $n=162$ ). A higher proportion of males than females had no previous knowledge of COPD (60% vs. 40%) and this difference was statistically significant ( $p < 0.05$ ). Sixty one percent of those who had a college level education or higher had previous knowledge of COPD versus 49% of those who had secondary level education only. This difference was not statistically significant ( $p = 0.086$ ), which may be attributable to a small numbers in each group. Of participants who had previous knowledge of COPD, 61% had a family history of lung disease versus 48% that did not have a family history of lung disease. This difference approached but did not reach statistical significance ( $p = 0.066$ ), which may be attributable to small numbers within groups. A total of 43.5% of participants had symptoms of lung disease. Symptoms of lung disease were defined as follows: breathlessness, wheezing, and/or coughing. Of those with symptoms of lung disease, 69% were smokers/ex-smokers and 53% were male. Nearly 90% of those with symptoms were over the age of 45 ( $p < 0.05$ ). Three quarters did not have a college level education and nearly a quarter had a family history of lung disease. As can be seen from Table 2, of the 63 participants (18%) who were referred to their GP because of abnormal spirometry, 86% were smokers or ex-smokers ( $p < 0.05$ ) and 54% were male. 86% were over the age of 45. Nearly half (49.2%) reported symptoms of lung disease while almost 25.4% had a family history of lung disease.

**Table 2: Those Referred for spirometry**

	Yes		No		P
	N	%	N	%	
<b>Gender</b>	63	100	289	100	0.783
Male	34	54.0	152	52.6	
Female	29	46.0	137	47.4	
<b>Smoking Habits</b>	63	100	289	100	0.003
Smoker/ Ex-smoker	54	85.7	193	66.8	
Non Smoker	9	14.3	96	33.2	
<b>Education Level</b>	63	100	289	100	0.728
Primary	9	14.3	36	12.5	
Junior Cert	23	36.5	48	16.6	
Leaving Cert	10	15.9	113	39.1	
College Degree	13	20.6	47	16.2	
Postgrad Degree	3	4.7	20	6.9	
Missing	5	7.9	25	8.7	
<b>Family History of Lung Disease</b>	63	100	289	100	0.283
Yes	16	25.4	56	19.4	
No	47	74.6	233	80.6	
<b>Symptoms of Lung Disease</b>	63	100	289	100	0.310
Yes	31	49.2	122	42.2	
No	32	50.8	167	57.8	

## Discussion

Approximately one in five people (18%) self-presenting to a mobile COPD spirometry clinic were found to have abnormal spirometry and were referred to their GP. Less than half of the participants were aware of COPD prior to attending this event. While this is a self-presenting population, and therefore results cannot be extrapolated to the general population, these results for an Irish population appear to support what is known from the international literature i.e. that COPD is under diagnosed and undertreated<sup>10,11</sup>. As expected, those from a lower educational background, smokers and males were more likely to report symptoms of lung disease and/or be referred. This is consistent with what is known about the epidemiology of COPD. Since this was a self-presenting population, participants are likely to have

been concerned about or interested in their lung health and their knowledge of COPD to be higher than the general population. The participants may also have been more likely to answer in the affirmative to questions relating to respiratory symptoms, as questionnaires are likely to have a high sensitivity but a lower specificity. Yet, only 48% of this population knew of COPD prior to this event. Those particularly at risk of COPD, i.e. current or ex-smokers, had similarly low levels of knowledge of COPD to non-smokers. Those with a family history of lung disease also had low levels of knowledge of COPD. Smoking is a factor in 85% of those with COPD<sup>5</sup>. The prevalence of COPD is directly related to the prevalence of cigarette smoking<sup>12</sup>. The HSE National Tobacco Control Office reported a smoking prevalence of 19.5% of whom 54.1% were males, and 19.2% aged over 55 years with the highest cigarette smoking prevalence rates in the lower income groups<sup>13</sup>.

In this study population, awareness levels were lower in those with lower education levels, despite COPD disproportionately affecting lower socioeconomic groups. In light of this evidence, it is clear that improved education and awareness of COPD is required, particularly for at-risk groups such as smokers. It has been proven that providing educational resources to those at risk for COPD, can significantly improve their knowledge of the disease although it has no significant impact on their behaviour<sup>14,15</sup>. However, by increasing awareness for COPD, more people can attend health-care services, where treatment and prevention can be initiated. There are limitations to this study. Participants self-presented to this clinic therefore results cannot be extrapolated to the general population. Sites for the clinic were chosen on the basis of a local COPD support group in the area. Therefore, the level of knowledge in these areas may be overestimated, due to the presence of a support group in the area. This study, in a self-selected group of participants, identified abnormal spirometry results in 18% of participants, which required referral. Nearly 44% of all participants had symptoms suggestive of COPD and of these participants, a fifth had abnormal spirometry and nearly 60% had not attended any healthcare services in the previous year. Despite COPD being a major cause of death and hospitalisation in Ireland, low levels of awareness of COPD were identified in participants, particularly in those who had lower levels of education. Those at greatest risk of COPD, i.e. current or ex-smokers, had low levels of awareness of COPD, which did not differ from those least at risk. This needs further exploration, as early diagnosis of COPD is associated with reduced health care costs, improved quality of life and improved symptom control.

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